



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

*Amo*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,919	12/03/2001	Jerome Maillot	1252.1056	4265

21171 7590 01/06/2004  
STAAS & HALSEY LLP  
SUITE 700  
1201 NEW YORK AVENUE, N.W.  
WASHINGTON, DC 20005

EXAMINER

CHEN, PO WEI

ART UNIT PAPER NUMBER

2676

DATE MAILED: 01/06/2004

*8*

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/998,919

Applicant(s)

MAILLOT ET AL.

Examiner

Po-Wei (Dennis) Chen

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on October 29, 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19, 22-25 and 28-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19, 22-25 and 28-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(e). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

In response to an Amendment received on October 29, 2003. This action is final.

Claims 1-19, 22-25 and 28-38 are pending in this application. Claims 1, 22, 28, 31, 33-38 are independent claims.

The present title of the invention is "Dynamically Adjusted Brush For Direct Paint Systems on Parameterized Multi-Dimensional Surfaces".

The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to help us serve you better.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9, 11-19, 22-24, 28, 31-35 and 38 rejected under 35 U.S.C. 102(e) as being anticipated by Daniels et al. (US 6,268,865; refer to as Daniels herein).

3. Regarding claim 1, Daniels discloses a method for three-dimensional painting comprising:

Selecting an area of a displayed parametric object living in three dimensional or higher space; painting a brush directly onto a surface of the area (lines 31-37 of column 2). Also, the background disclosed by Daniels also suggested the method of painting directly onto the 3-D surface (lines 63-67 of column 1 and lines 1-2 of column 2).

Art Unit: 2676

4. Regarding claim 2, Daniels discloses a method for three-dimensional painting comprising:

The painting is performed view independently (lines 19-29 of column 12 and Fig. 9; the painting brush data is saved independently from the view information).

5. Regarding claim 3, Daniels discloses a method for three-dimensional painting comprising:

The painting first aligns the brush to a normal vector of the surface (lines 43-45 of column 15).

6. Regarding claim 4, Daniels discloses a method for three-dimensional painting comprising:

The painting is performed without first painting the brush on a two dimensional texture space corresponding to the object (lines 11-16 of column 10; the method disclosed by Daniels does not painting on texture, instead, the painting stroke is being mapped onto the 3-D object surface).

7. Regarding claim 5, Daniels discloses a method for three-dimensional painting comprising:

Converting a selected two dimensional screen coordinate into a three dimensional world coordinate (lines 30-35 of column 12 and 28-35 of column 13 and Fig. 9).

8. Regarding claim 6, Daniels discloses a method for three-dimensional painting comprising:

Art Unit: 2676

Identifying an intersection point by intersecting a vector comprising the three dimensional world coordinate and a viewing direction, and the object (lines 30-35 of column 12 and 28-35 of column 13 and Fig. 9).

9. Regarding claim 7, Daniels discloses a method for three-dimensional painting comprising:

Computing a tangent plane by computing a normal vector at the intersection point; and projecting the brush on the three dimensional surface of the selected area using the tangent plane (lines 41-59 of column 15 and Fig. 15-16).

10. Regarding claim 9, Daniels discloses a method for three-dimensional painting comprising:

Computing a tangent plane by computing a normal vector at an intersection point where the brush is applied; and projecting the brush on the surface of the selected area using the tangent plane (lines 41-59 of column 15 and Fig. 15-16).

11. Regarding claim 11, Daniels discloses a method for three-dimensional painting comprising:

The brush is two dimensional (element 16 of Fig. 1).

12. Regarding claim 12, Daniels discloses a method for three-dimensional painting comprising:

The brush is three dimensional (lines 36-37 of column 2).

13. Regarding claim 13, Daniels discloses a method for three-dimensional painting comprising:

The brush is cylindrical with a defined depth (lines 53-62 of column 2 and lines 16-19 of column 3).

14. Regarding claim 14, Daniels discloses a method for three-dimensional painting comprising:

An intensity of portions of a brush painting varies based on a normal vector of respective portions of the surface (lines 10-21 of column 17; the brush width corresponds to the intensity of a brush painting).

15. Regarding claim 15 and 16, Daniels discloses a method for three-dimensional painting comprising:

The painting stops beyond a portion of the surface with a normal vector which varies more than a predetermined angle from an intersection point normal and the predetermined angle is 90 degrees (lines 46-59 of column 15 and Fig. 15). It is noted that the painting corresponds to stroke width. And the width will be limited to a maximum size when normal vector is normal (or 90 degrees) to P, the view point intersection on the surface.

16. Regarding claim 17, Daniels discloses a method for three-dimensional painting comprising:

The painting stops beyond a portion of the surface when a distance from the brush to the portion of the surface is greater than a predetermined threshold (lines 33-43 of column 8 and Fig. 4). It is noted that the brush width corresponds to painting and it stops when the normal distance is greater than certain threshold depending on the size of brush chose.

17. Regarding claim 18, Daniels discloses a method for three-dimensional painting comprising:

Art Unit: 2676

Before the painting, the brush is rotated in a brush stroke direction (lines 34-41 of column 20).

18. Regarding claim 19, Daniels discloses a method for three-dimensional painting comprising:

Before the painting, a brush resolution for the brush is determined and applied (lines 5-9 of column 9).

19. Regarding claim 22, Daniels discloses a method for three-dimensional painting comprising:

A method of implementing an effect brush (lines 4-5 of abstract);

Selecting a selected area of a displayed parametric object living in three dimensional or higher space (lines 3-4 of abstract);

Reverse projecting texture from a surface of the selected area onto a temporary brush (see lines 19-29 of column 12 and Fig. 9; the saved stroke data corresponds to temporary brush which is mapped to the surface of the selected view that contains surface map information that corresponds to texture), processing the temporary brush using a selected process (lines 30-31 of column 12), and projecting the temporary brush onto the surface of the selected area (lines 28-36 of column 13 and Fig. 9).

20. Regarding claim 23, Daniels discloses a method for three-dimensional painting comprising:

The selected process uses a particular filter (lines 21-24 of column 6).

21. Regarding claim 24, Daniels discloses a method for three-dimensional painting comprising:

Art Unit: 2676

The selected process uses a particular brush (lines 21-24 of column 6; different selected process corresponds to different brush).

22. Regarding claim 28, as statements presented above, with respect to claims 1 and 9 above are incorporated herein.

23. Regarding claim 29, Daniels discloses a method for three-dimensional painting comprising:

Determining a normal to the surface at the point (lines 43-45 of column 15 and Fig. 15);

Determining a radius and a depth of the brush in a plane tangent to the surface at the point (lines 46-59 of column 15 and lines 43-67 of column 20 and lines 1-12 of column 21 and Fig. 15). While claim recites radius, by determining the width of the brush, will also determines the radius of the brush. The depth is determined depending on the focus and amount of emphasis given to the point;

Bringing the brush and the surface into coincidence along the normal (lines 28-36 of column 13 and lines 46-59 of column 15 and Fig. 9 and 15). It is noted the brush width data is being determined and mapped on the surface normal point;

Determining portions of the object intersected by the brush using the depth and the radius (lines 46-59 of column 15 and lines 43-67 of column 20 and lines 1-12 of column 21 and Fig. 15). The width of the brush corresponds to the portion of the object intersected by the brush and depending on the focus and amount of emphasis, different width is computed;

Applying paint to corresponding portions of object texture in texture space (lines 19-29 of column 12 and lines 28-36 of column 13). The brush data is being mapped on to the object surface which contains surface map information that corresponds to texture;



While Daniels does not disclose applying the texture to the object in the invention, the method is disclosed in the background information (lines 55-62 of column 1).

24. Regarding claim 31, Daniels discloses a method for three-dimensional painting comprising:

Defining a series of points on the parameterized object representing a stroke (lines 29-35 of column 6 and Fig. 2);

Positioning and orienting a brush stamp for each point in the series of points in a view independent manner (lines 29-35 of column 6 and lines 19-29 of column 12 and Fig. 9; the brush point data is saved independently from the view information);

Painting the stroke into an object texture as a collection of texture modifications using the brush stamp for each point (lines 28-36 of column 13 and Fig. 9; the surface map information corresponds to texture information and is being modified by the brush stroke data).

25. Regarding claim 32, Daniels discloses a method for three-dimensional painting comprising:

A method as recited in claim 1, further comprising compiling images produced by the painting into a movie (lines 1-2 of abstract).

26. Regarding claim 33, as statements presented above, with respect to claims 1 and 32 are incorporated herein.

27. Regarding claim 34, as statements presented above, with respect to claim 1 are incorporated herein. Also see Fig. 29.

28. Regarding claim 35, as statements presented above, with respect to claim 1 are incorporated herein.

Art Unit: 2676

29. Regarding claim 38, as statements presented above, with respect to claim 1 are incorporated herein. It is further noted that the brush stroke being applied to the surface is defined in accordance with the tangent plane (lines 41-59 of column 15 and Fig. 15-16). Thus, it functions as using a tangent space brush.

***Claim Rejections - 35 USC § 103***

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

31. Claims 8, 10 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daniels et al. (US 6,268,865; refer to as Daniels herein), as applied to claims 1 and 28 above, and further in view of Morioka et al. (US 6,239,809; refer to as Morioka herein).

32. Regarding claims 8, 10 and 30, Daniels discloses a method for three-dimensional painting comprising normal vector (element 253 of Fig. 15). It is noted that Daniels does not disclose interpolated normal vector. However, this is known in the art taught by Morioka. Morioka teaches a image processing comprising a interpolated normal vector (lines 28-31 of column 12). It would have been obvious to one of ordinary skill in the art at time of invention to utilize the teaching of Morioka to provide a more efficient image processing (lines 17-21 of column 2, Morioka). Also, both Daniels and Morioka are directed to image processing in three-dimensional space.

Art Unit: 2676

33. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniels et al. (US 6,268,865; refer to as Daniels herein), as applied to claim 22 above, and further in view of Bossut (US 6,239,807).

34. Regarding claim 25, it is noted that Daniels does not disclose the particular brush is selected based on a determination of an appropriate brush resolution. However, this is known in the art taught by Bossut. Bossut teaches a method for multi-resolution texture mapping that “offers the user the capability of touching up coarse details at one resolution, and fine details at a magnified resolution” (lines 49-60 of column 6). It would have been obvious to one of ordinary skill in the art at time of invention to utilize the teaching of Bossut to provide the advantage of allowing user to choose the appropriate resolution for painting the image.

35. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniels et al. (US 6,268,865; refer to as Daniels herein) and further in view of Morioka et al. (US 6,239,809; refer to as Morioka herein).

36. Regarding claim 36, as statements presented above, with respect to claims 1-8, 14, 15 and 17 are incorporated herein.

37. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiss (US 5,592,597) and further in view of Daniels et al. (US 6,268,865; refer to as Daniels herein).

38. Regarding claim 37, Kiss discloses a real-time image generation system with 3-D graphics comprising:

Selecting an area of a displayed parametric object in a three dimensional space; painting

the brush directly onto a surface of the area in the three dimensional space (lines 10-15 of column 8 and lines 17-25 of column 9 and Fig. 1-2; it is noted that any view of the object can be selected for painting process).

Kiss does not disclose determining a brush based on an appropriate brush resolution. Daniels discloses a method for three-dimensional painting utilizing the method (lines 5-15 of column 9; it is noted that the brush strokes being used can be at different resolutions by using the brush profile to define the appropriate resolution for display). It would have been obvious to one of ordinary skill in the art to utilize the teaching of Daniels to provide the advantages of speed and efficiency when painting brush strokes onto image surfaces such as one disclosed by Kiss (lines 13-15 of column 9 of Daniels).

#### ***Response to Arguments***

39. Applicant's arguments filed October 29, 2003 have been fully considered but they are not persuasive.

The Applicant argues reference Daniels does not disclose painting a brush directly onto a surface of the area displaying parametric objects in 3D. However, the limitations presented in claim 1 is met by the teaching of Daniels as statements presented above with respect to claim 1 above are incorporated herein. While claim recites selecting an area of a displayed parametric object living in three dimensional or higher space, by selecting a view of a 3-D model object (a parametric object living in three dimensional), the limitation is met. Furthermore, the brush is being painted directly onto the view selected (a surface of the area). Since the claim only recites selecting the area of the object living in three dimensional space and does not disclose the painting is done on the surface of the area in three dimensional, the limitation is met by Daniels.

The Applicant argues reference Daniels does not show painting in a view independent manner. However, the limitations presented in claim 2 is met by the teaching of Daniels as statements presented above with respect to claim 2 are incorporated herein. While claim recites painting is performed view independently, the terms are broad enough to include the method disclosed by Daniels where the painting brush data is being saved independently from the view information.

The Applicant argues reference Daniels discloses avoiding painting on texture for a different purpose disclosed by the Applicant. However, the limitations presented in claim 4 is met by the teaching of Daniels as statements presented above with respect to claim 4 are incorporated herein. The limitation does not disclose any other detail and is broad enough to include the method disclosed by Daniels where the painting stroke is being mapped onto the 3-D object surface without painting on the texture.

Regarding claims 8,10 and 30, the Applicant argues it would not have been obvious to combine references Daniels with Morioka. However, by utilize the teaching of interpolating normal vector, it will provide a better result of calculating pixel values for image processing in three-dimensional space such as one disclosed by Daniels. Furthermore, a more efficient image processing will be achieved (lines 17-21 of column 2 of Morioka).

### ***Conclusion***

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Geshwind (US 6,590,573).

Art Unit: 2676

41. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

#### ***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-8365. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

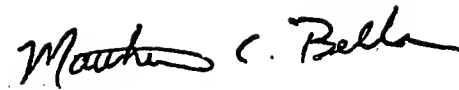
Po-Wei (Dennis) Chen  
Examiner  
Art Unit 2676

Application/Control Number: 09/998,919

Page 14

Art Unit: 2676

Po-Wei (Dennis) Chen  
December 31, 2003

A handwritten signature in black ink, reading "Matthew C. Bella". The signature is written in a cursive style with a large, stylized "M" and a long, sweeping underline.

MATTHEW C. BELLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600